

Exam Review – Grade 9 Academic Science (SNC1D)

Unit 3 Study of the Universe

1. Know the different celestial objects in the sky (Sun, Moon, etc.) and be able to define Astronomy and what an astronomer does. Know the name of our Galaxy and how a star is formed. Know what is an AU and light-year and be able to compare them. Know that an asteroid belt separates the Inner Planets from the Outer Planets.. Know the terms binary system of stars, supernova and nebula.
2. Know that the Milky Way is 100000 light years in diameter and the relative location of our solar system. Know what makes a Galaxy and the terms Black Hole, Dark Matter and Star and Galaxy Clusters. Know the differens Shapes of Galaxies (ie. Spiral, Eliptical and Irregular)
3. Know what the evidence is for the Big Bang Theory. Know that the electromagnetic spectrum and spectroscope are used to identify chemical components of distant stars using spectral lines. Know that spectral lines shift when stars are moving.
4. Know what is a constellation, asterism and astronomical phenomenon. Describe generally how a star is formed and the difference between low, medium and high mass stars. Know the outcomes of supernovas (ie neutron stars or black holes)
5. Know parts of the sun (ie, solar flares, core, chromosphere etc.) and what are some of their features. Know how the sun affects earth (ie solar winds and aurora borealis). Know how the solar system was formed. Know the Rocky Inner Planets and Gaseous Outer Planets and that the asteroid belts separate them. Know some of the minor planets such as Pluto and Charon. Know the difference between a comet and meteor.
6. Know how Day and Night are affected by Earth's spin, and the different phases of the moon. Know how seasons are affected by the axis tilts. Know the difference between a solar eclipse and a lunar eclipse. Know why tides form.
7. Know about the Voyager 1 and 2 and what their missions were. Know what is the summer and winter solstice and the equinox. Know what tools were used historically (ie. sundials) and the tools used presently (optical and radio telescopes)
8. Name some benefits of research in space (ie spinoffs). Know what are the different modes of space transportation technologies. Know what are the uses of satellites (ie communications, GPS)
9. Know what are some of the challenges and hazards of travelling to and from space and living in space (affect on heart and bones). What are some challenges with living on the moon or visiting and living on Mars?

Unit 2 Atoms Elements and Compounds

1. Know states, changes of states, Particle Theory of Matter, and the classification of matter (ie. pure substance, mixtures, element, compound, etc.).
2. Know how to solve density problems, both mathematically or by calculating the slope of a mass volume graph.
3. Know the meaning of various types of physical properties such as colour, conductivity, density, malleability etc. Know the meaning of various types of chemical properties such as combustibility and reactivity. Be able to use these to describe something or event
4. Know Dalton's, JJ Thomson's, Rutherfords, Chadwick's and Bohr's general contribution to atomich theory. Know the parts of an atom and their location and relative mass (ie. heaviest or lightest particle, in the nucleus or in the energy shells)
5. Know the different types of elements (ie. metal, non-metal and metalloid) and the element symbols for the first 20 elements and other common elements like iron and copper.
6. Know why the periodic table is organized as it is and who first organized it. Know what is the atomic number and mass number and what it represents. Know chemical families in a periodic table and their general properties (ie. alkali metals-very soft and reactive, noble gases - nonreactive etc.) and similarity in electron arrangement. Be able to identify patterns to organize something like a periodic table.
7. Identify the formula for common compounds such as water, carbon dioxide, salt and oxygen.
8. Know about the dangers of mercury in water systems and CFCs to the ozone layer.

Exam Review – Grade 9 Academic Science (SNC1D)

Unit 1 Sustainable Ecosystems

1. Know the various terms related to ecosystems (such as biomes, population, habitat etc.
2. Know the general components of the water cycle, nutrient cycle and carbon cycle. Know what is photosynthesis and cellular respiration and the difference between them. Know terms and what makes a food chain, web and energy pyramid.
3. Know about populations, competition, predation and symbiosis. Know the characteristics and factors that affect populations
4. Know about sustainability, biodiversity, habitat and the affects on these from human impact such as pollution and water usage on the ecosystem. Know about invasive species and climate change.
5. Acid rain and pollution affect the environment. Know how water quality is assessed (ie measuring oxygen levels, BOD, number and type of organisms). Know about the affect of pollution on our environment.

Unit 4 Characteristics of Electricity

1. Know the parts of the atom and what particle is involved with static electricity. Know how to use the triboelectric series and the laws of attraction and repulsion. Know what is an insulator and conductor and what materials make good insulators and conductors.
2. Know how an electroscope works. Know the difference between charging by friction, charging by contact, and charging by induction. Know how electricity is discharged (ie. grounding, lightning)
3. Know how lightning forms and how a lightning rod works. Know how vehicles discharge electricity, and how it can be discharged at home.
4. Know the different parts of an electric circuit (ie. load, source, switch etc.). Know the parts of an electrochemical cell (ie. electrolyte and electrode) and the difference between a wet and dry cell. Know how potential energy is measured (ie. potential difference or voltage) and how to measure this (voltmeter). Be able to describe electron transfer (ie current) and the different types of transfer (AC and DC). Know how current is measured (ammeter measures amps). Know what is resistance, how it is measured and what can causes it.
5. Know how to draw circuit diagrams and know the symbols for different components. Know the difference between series and parallel circuits and how to draw them. Know why one is used over the other.
6. Know Ohm's Law and how to solve mathematical problems or solve graphically with slope. Know what is a short circuit and the use of fuses and circuit breakers for electrical safety. Why do we use three-pronged plugs and FGI's.
7. Know the difference between renewable and non-renewable resources. Know generally what is a generator, turbine and energy grid. What are the different ways electricity can be generated (ie. nuclear, thermal, biomass) and some alternate resources (ie. solar, wind, etc). Know some advantages and disadvantages of these sources.
8. Know how to calculate kWh and the cost of electricity. Know how to calculate the percent efficiency of electricity use. Know how to read an EnerGuide labe, and what is the Energy Star symbol. Be able to compare efficiency. Have some strategies for conserving energy at home. Know that devices on standby, still take up energy.

SPACE REVIEW QUESTIONS-Gr. 9 Academic Science

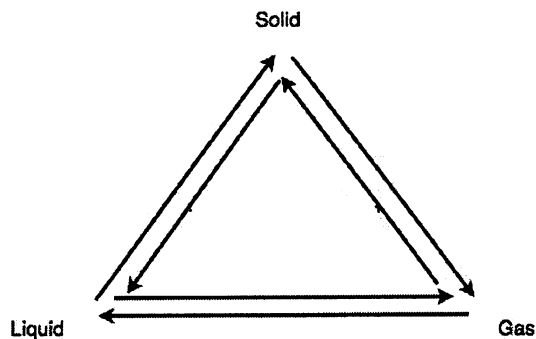
1. Define the following key terms by using your notes, texts and pictures from your textbook: celestial object, astronomer, solar system, star, nuclear fusion, astronomical unit (AU), light-year (ly), binary system, supernova, nebula, black hole, dark matter, classification of galaxies by shapes and clusters, big bang theory, evidences of big bang theory, Astroid Belt, comet, meteor, constellation, asterisms, rotation, revolution, tides, International Space Station
2. What is the name of the galaxy that we live in?
3. Make a simple diagram to show the relationship between the Milky Way galaxy and the Local Supercluster of galaxies.
4. Why do galaxies with more dust produce more new stars?
5. What is the relationship between supernova and nebula?
6. How is it possible to detect the black hole at the centre of the Milky Way if the black hole itself is invisible?
7. According to the Big Bang Theory, how did the universe originate 13.7 billion years ago?
8. Astronomers have officially listed a total of 88 constellations, list at least 10 of them by using your star map.
9. Smaller recognizable star patterns within a larger constellation are known as asterisms. List couple of them by using your star map.
10. a) List the layers of our Sun? b) Briefly explain what is happening in each layer? c) The Sun is composed almost entirely of what element?
11. The four rocky planets and the four gaseous planets are divided by the Asteroid Belt. List these eight planets starting at our Sun.
12. In term of mass, what kind of star is the Sun: low, medium, or high?
13. How long has the Sun existed? How much longer is it expected to shine?
14. What kind of motion of the Earth creating day and night?
15. How much time does one revolution of Earth take?
16. Sketch a diagram which explains why the Earth's tilted axis and the planet's revolution around the Sun causes the changing of seasons?
17. Why the Moon and the Sun causing two tides per day in the Earth's oceans?
18. Chris Hadfield was one of the astronauts who installed Canadarm2 during a space walk from the International Space Station. Canadarm2's primary job is Space Station assembly. If you would be in charge what new section would you add to the International Space Station?
19. List the pros and cons of space exploration.
20. What difficulties can astronauts face if they were to land another earthlike planet?

GRADE 9 EXAM REVIEW - Chemistry

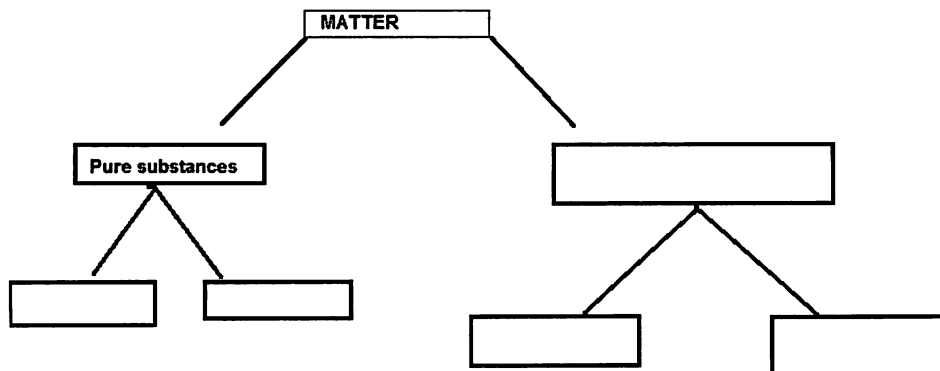
1. Write the meaning of each of the following symbol.



2. Write the change of state represented by each arrow in the diagram given below.



3. Complete the missing terms in each box.



4. Describe the physical property of a wood log. Give Quantitative and Qualitative properties. Give a Chemical property too.

5. What are the symbols for each element below? Draw the Bohr Diagram for each. Determine which element would lose electrons. Which one gains electrons?

- a) Lithium & Fluorine
- c) Hydrogen & oxygen

- b) calcium & oxygen
- d) magnesium & chlorine

6. Write the names for these common compounds

H ₂ O	CO ₂
NaCl	O ₂

USE GRASP to solve the following problems

7. Calculate the density of a material that has a mass of 52.457 g and a volume of 13.5 cm³.

8. What is the mass of a 350 cm³ sample of pure silicon with a density of 2.336 g/cm³?

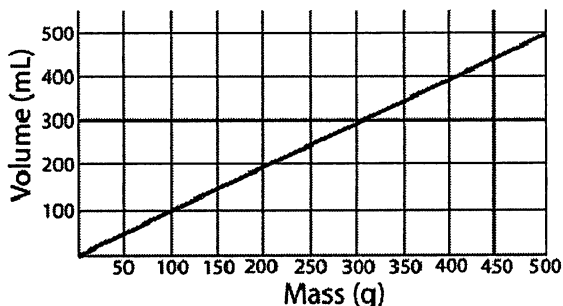
9. Color the periodic table with a legend for the following: Alkalie Metals, Alkaline Earth Metals, Halogens, Noble Gases, Transition Metals.

hydrogen 1 H 1.0079																	helium 2 He 4.0026
lithium 3 Li 6.941	beryllium 4 Be 9.0122											boron 5 B 10.811	carbon 6 C 12.011	nitrogen 7 N 14.007	oxygen 8 O 15.999	fluorine 9 F 18.998	neon 10 Ne 20.180
sodium 11 Na 22.990	magnesium 12 Mg 24.305											aluminum 13 Al 26.982	silicon 14 Si 28.086	phosphorus 15 P 30.973	sulfur 16 S 32.065	chlorine 17 Cl 35.453	argon 18 Ar 39.948
potassium 19 K 39.098	calcium 20 Ca 40.078	scandium 21 Sc 44.956	titanium 22 Ti 47.887	vanadium 23 V 50.942	chromium 24 Cr 51.996	manganese 25 Mn 54.938	iron 26 Fe 55.845	cobalt 27 Co 58.933	nickel 28 Ni 58.693	copper 29 Cu 63.546	zinc 30 Zn 65.39	gallium 31 Ga 69.723	germanium 32 Ge 72.61	arsenic 33 As 74.922	selecnium 34 Se 78.96	bromine 35 Br 79.904	krypton 36 Kr 83.80
rubidium 37 Rb 85.468	strontium 38 Sr 87.62	yttrium 39 Y 88.906	zirconium 40 Zr 91.224	niobium 41 Nb 92.906	molybdenum 42 Mo 95.94	technetium 43 Tc [98]	ruthenium 44 Ru 101.07	rhodium 45 Rh 102.91	palladium 46 Pd 106.42	silver 47 Ag 107.87	cadmium 48 Cd 112.41	indium 49 In 114.82	tin 50 Sn 118.71	antimony 51 Sb 121.76	tellurium 52 Te 127.60	iodine 53 I 126.90	xenon 54 Xe 131.29
cesium 55 Cs 132.91	barium 56 Ba 137.33	* 57-70	lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm [145]	samarium 62 Sm 150.36	europlum 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04	radium 88 Ra [226]
francium 87 Fr [223]	radium 88 Ra [226]	* *	actinium 89 Ac [227]	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np [237]	plutonium 94 Pu [244]	americium 95 Am [243]	curium 96 Cm [247]	berkelium 97 Bk [247]	californium 98 Cf [251]	einsteinium 99 Es [252]	fermium 100 Fm [257]	mendelevium 101 Md [258]	nobelium 102 No [259]	copernicium 110 Cn [285]
											unnilium 110 Uun	ununium 111 Uuu	unbinium 112 Uub				ununseptium 114 Uuq

* Lanthanide series

lanthanum 57 La	cerium 58 Ce	praseodymium 59 Pr	neodymium 60 Nd	promethium 61 Pm	samarium 62 Sm	europlum 63 Eu	gadolinium 64 Gd	terbium 65 Tb	dysprosium 66 Dy	holmium 67 Ho	erbium 68 Er	thulium 69 Tm	ytterbium 70 Yb
actinium 89 Ac	thorium 90 Th	protactinium 91 Pa	uranium 92 U	neptunium 93 Np	plutonium 94 Pu	americium 95 Am	curium 96 Cm	berkelium 97 Bk	californium 98 Cf	einsteinium 99 Es	fermium 100 Fm	mendelevium 101 Md	nobelium 102 No

10. What is the density for the data given below?



11. State the contributions to atomic theory for Bohr and Rutherford.

Electricity Review

G.9 Academic Science

These questions are meant to be used along with your class notes and your textbook.

You should begin your studying by first organizing your notes. Separate all of your electricity notes and put them in order by date or by subject. Then read them. After you have reviewed your notes, take a look at the following questions and answer them. If you have difficulty, then refer to your textbook or do a Google search. Your last resort will be to contact your teacher for extra help.

1. Define the following vocabulary words: electron, charge, Coulomb, charging (contact, friction, induction), discharging, static charge, insulator, conductor, current, voltage, volt, Ampere, amp, resistance, ohm, energy, Joule, power, Watt, kilowatt-hour, source, load, control (switch), protection (fuse)
2. State the law of electrostatics (aka the laws of attraction and repulsion).
3. If you rub cotton on human hair, by pulling on a t-shirt for example, what charge would your hair end up with?
4. If you charged a balloon by touching it with a charged ebonite rod (recall, ebonite gets a negative charge), how would the charge be distributed on the balloon?
5. If you charged a metal sphere by touching it with a charged ebonite rod, how would the charge be distributed?
6. If you charge an ebonite rod and bring it near, but not touching, a metal object, how would the charge redistribute in the metal object?
8. What is lightning? Describe three ways that you could protect yourself from lightning.
9. Describe how electrostatics are used in industry to improve the adhesion of paint.
10. Describe how an electrostatic precipitator removes dust from air.
11. What are the differences between dry cells and wet cells?
12. When a battery is no longer useful, why is it important to dispose of it as hazardous waste and not simply throw it into the trash?
13. Voltage is a measurement of electrical potential difference. What is meant by "electrical potential difference"?
14. If a circuit has a current of one Ampere flowing in it, what does that mean with regards to charge or electron flow?
15. What is the difference between static charge and current flow?
16. Describe the difference between direct and alternating current. Provide one source of each.
17. Imagine that you are walking through a crowded mall. What is this situation analogous to? Choose between voltage, resistance or current. Explain your choice.
18. (Not everybody did the following...) Describe the relationship between voltage, current and resistance.
19. List four physical factors that affect a conductor's resistance to current flow.
20. Draw the symbols for: wire, cell, battery, lamp, resistor, switch, ammeter, voltmeter.

21. Draw a simple electric circuit with a 1.5 v cell as the source, a lamp as the load, a knife-blade switch as control and a fuse as protection.
22. In the above circuit, if another lamp was added in series, what would happen to the brightness of the lamp?
23. From q.21, if another lamp was added in parallel, what would happen to the brightness of the lamp?
24. Draw a circuit with a 4.5 v battery and three lamps connected in series. On your diagram, add a voltmeter to measure the voltage across any one of the lamps and an ammeter to measure the current coming out of the battery.
25. Draw a circuit with a 4.5 v battery and three lamps connected in parallel. If you measured the voltage across each of the three lamps, what would you notice?
26. In the generation of electricity, turbines are usually used to turn a generator. List three electrical generation methods that employ turbines.
27. Describe the generation method that doesn't employ a turbine. State two disadvantages of this method.
28. Hydroelectricity is the most common electrical generation method in Quebec. Ecologically speaking, what are the disadvantages of hydroelectricity?
29. What do you think is the most sustainable method of generating electricity? Explain your reasoning.
30. We measure our electricity usage in kilowatt•hours. What does the kilowatt•hour actually measure?
31. Calculate the cost of operating an electric fan for 12 hours if the fan draws 0.3 A at 120 volts and electricity costs 10.6 cents per kilowatt•hour.
32. Graph the following data with voltage on the horizontal axis and current on the vertical axis. Label the axis including units. Draw a line of best fit through the data points. Title the graph "Relationship between voltage and current in an electrical circuit".

Voltage (v)	Current (A)
0	0
1.5	1.2
3.0	2.6
6.0	5.0
9.0	10.2

Unit 1: Sustainable Ecosystems Review

1. Define the following:

- a) environmental stewardship
- b) sustainability
- c) biodiversity
- d) ecosystem

2. What are the characteristics of a sustainable ecosystem.

3. Explain why biodiversity is important in sustaining an ecosystem.

4. Examine the picture below:

- a) Identify a species, a population, a community and an ecosystem.
- b) List the abiotic and biotic components from the picture below.
- c) Write a food chain and identify the producer, primary and secondary consumer and decomposer.
- d) Suppose the frog were removed from a food chain. Describe two ways in which the food chain would be affected.
- e) List three possible interactions between the deer and its environment.
- f) How is this pond ecosystem sustained?

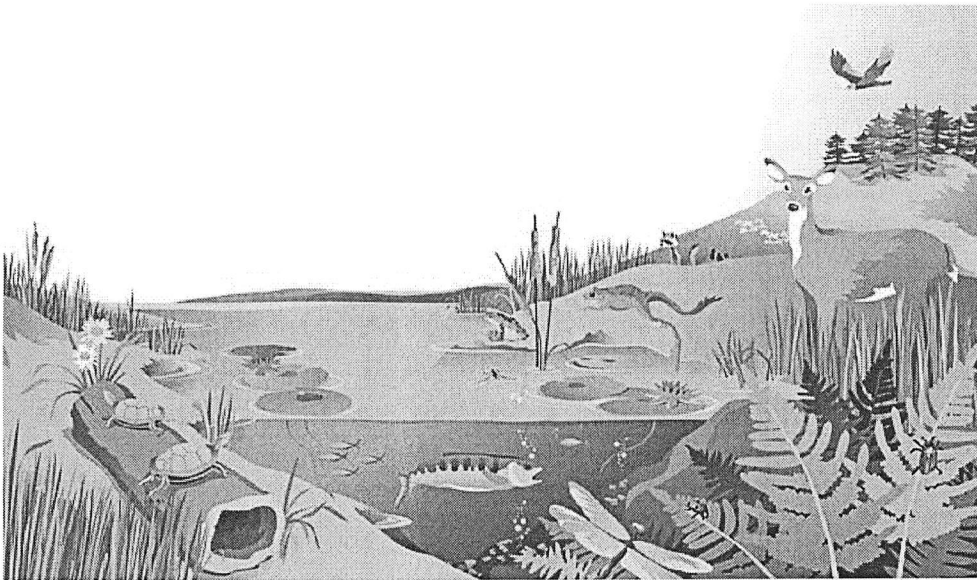


Illustration by Jeff Grader / property of Delta Education

5. What is one abiotic factor that can limit a population? What is one biotic factor that can limit a population?

6. What are the 5 terrestrial biomes of Canada? How is each biome defined by its vegetation?
7. List the components of the biosphere.
8. Give an example of how water moves from the biotic to the abiotic part of the atmosphere.
9. A farm that uses large volumes of fertilizer to increase crop yields is situated beside a lake. What could happen to the lake if the fertilizer ran off into the lake without first being treated?
10. Explain the significant role of bacteria in the nitrogen cycle.
11. a) Write the word equation for photosynthesis and cellular respiration.
b) Explain relationship between photosynthesis and cellular respiration and its significance to an ecosystem.
12. Explain what happens to the energy that is transferred from a producer all the way to a decomposer.
13. Match the vocabulary words in Column 1 with the choices in Column 2.

Column 1 Vocabulary Words		Column 2 Choices
1. Competition		A. Equal number of births and deaths.
2. predation		B. Maximum number of individual that can be supported by an ecosystem without affecting its ability to support future generations of the same species.
3. mimicry		C. When one species benefits at the expense of another.
4. symbiosis		D. An environmental factor that prevents an increase in the number of organisms in a population.
5. mutualism		E. When one species benefits from the relationship with another species but without benefit or harm to the other species.
6. commensalism		F. Both species benefit from the relationship.
7. parasitism		G. An organism looks like its predator to avoid getting eaten.
8. limiting factors		H. One organism eats another organism.
9. carrying capacity		I. Close interaction between two species.
10. equilibrium		J. Interaction between species fighting for the same resource

14. What caused the demise of Easter Island?

15. What could have been done differently to maintain a sustainable environment?
16. Explain the diversity within a species and the importance to its survival.
17. What impact does overexploitation of a resource have on an ecosystem?
18. a) Name an invasive species found in Ontario.
b) How has its presence affected the native species?
19. Differentiate between point source pollution and non-point source pollution.
20. What is habitat fragmentation? Give an example.
21. Discuss the impact of global warming on the Earth's temperature.
22. How is the Great Pacific Garbage Patch affecting the aquatic ecosystem?
23. What effect does acid rain have on the ecosystem?
24. Describe the importance of crop rotation.
25. Mercury, a heavy metal, entered an ecosystem after a tanker truck crashed into a guardrail. Ecologists have been monitoring the organisms in the ecosystem and have noticed that the top consumers (owls and foxes) have very large concentrations of mercury in their systems. Using the correct terminology, explain why this has happened.
26. A farm that uses large volumes of fertilizer to increase crop yields is situated beside a lake. What could happen to the lake if the fertilizer ran off into the lake without first being treated?
27. What are some conservation strategies in place to protect biodiversity?
28. Explain the significance of an environmental steward.
29. List two benefits from using sustainable building construction methods.